

2.2 The Genesis of the Committee on Scientific and Technical Information

COSATI was not the first interagency group formed to coordinate Federal STI programs. James R. Killian, President Eisenhower's Science Advisor, called on the National Science Foundation to form such a group. Whereupon, NSF's Director, Alan T. Waterman, assigned Burton W. Adkinson, the Head of the Office of Science Information Service, NSF, the task of establishing the Federal Advisory Committee on Scientific Information (FACSI) in 1959. The first action of NSF was to send a letter to Federal R&D agencies calling for the nomination of a representative to FACSI; 17 agencies responded and the task force was formed with Adkinson as its Chairman. Unfortunately, FACSI's life was relatively short. It was eliminated in 1961, the victim of President Kennedy's decision to eliminate as many committees as possible involved in Federal R&D programs. According to its Chairman, Burton Adkinson, the interagency committee was doomed before that because of the unwillingness of FACSI's members to make recommendations for changes that would come from NSF, then a small agency with a relatively minor R&D program, as they saw it, that would have to be implemented by the agencies. Notwithstanding this sociological problem, FACSI did make one contribution that was honored by its successor, the Committee on Scientific and Technical Information, the establishment of a Federal policy that accepted the principle of payment of page charges for publication in scientific journals. It was the successor to James B. Killian, Jerome B. Wiesner, who took a series of steps that gave urgency to the establishment of a stronger Federal STI program. It was Wiesner who established COSI in 1961 and charged the Crawford and Weinberg Panels to undertake their studies of Federal STI problems and issues. It was Wiesner who appointed J. Hilary Kelley to be the OST staff member to monitor STI programs, the first person responsible for STI programs at that level. It was Wiesner, who made a statement before the Senate Subcommittee on Reorganization and International Organizations that promised strong action by the Executive Branch to improve STI programs. It was Wiesner who braved the self-righteous wrath leveled at him by Senator Hubert H. Humphrey and reacted in such a positive manner as to defuse the conflict between the two branches of government.

Excerpts of what Wiesner said to Humphrey are as follows: ¹

Although the Federal agencies have long dealt with the needs for STI in carrying out their missions, the problem has taken on new dimensions requiring concerted action at the Presidential level. This is the result of the rapid growth of government R&D to the point where a majority of the scientists and engineers are engaged in government-financed work. The R&D is growing in complexity and sophistication as well as in magnitude. All this is taking place during a period of international stress and great and great demands on our national resources, requiring careful husbanding of time, funds and scarce technical manpower. Thus STI in Government has become a national problem and can no longer be considered on an agency-by-agency basis.

Wiesner went on to explain what had already been done: the Baker (PSAC) study undertaken in 1958, which resulted in the establishment of the Office of Science Information (OSIS) in the National Science Foundation; the establishment of the Federal Council for Science and Technology in 1969 "to enable more effective planning and administration of Federal scientific and technological programs; and a request to NSF to provide leadership in coordinating Federal government STI activities." Addressing the problem that FACSI had run into, he said:

(NSF) has achieved only limited success in developing a coordinated national scientific information system, since it has no administrative authority over other agencies. (This confirms Adkinson's point as to why FACSI was not successful.) Agency-wide coordination is being achieved through FCST. In May 1962, the Council agreed that a high-level focal point would be established in each agency to integrate and elevate the status of science information functions within their management. At the same time, the Council established a committee on STI to develop Government-wide standards and assure compatibility between agency systems...The creation of the Office of Science and Technology permits the exercise of leadership and initiative necessary to handle a technical management problem of this magnitude and complexity. I intend to make a major effort to identify needed improvements and see that they are rapidly brought about...Two simple, but essential points have emerged from our studies. First, scientific information is an integral part of R&D. Second, to cope with the ever-increasing flood of STI, all those connected with R&D - government agencies, technical societies, and individual scientists - will have to devote more thought, effort and resources to technical information than in the past.

Showing a remarkable understanding of the nature of the problem, Wiesner stated:

¹ U.S. Senate, Interagency Coordination of Information, Hearings before the Subcommittee on Reorganization and International Organizations, Senate Committee on Government Operations, U.S. Senate, Washington, D.C., September 21, 1962, Part 1, pp 242.

Too often, good information handling is confused with good management. Good information is necessary for good management; but good information does not necessarily imply good management...Nor does more information automatically mean better information. We are already deluged with a flood of documents. The principal need is not improvements in mechanical retrieval systems, though better automation is desirable. We need a way of switching information, not documents, to the user in as discriminatory manner as possible. The user should be informed, not overwhelmed.

His conclusions were right on the mark:

I conceive the information in the executive branch of Government to be an interlocking system of agency systems kept under surveillance by the Federal Council for Science and Technology and operating under the policy guidance of the Office of Science and Technology. While developing strong interconnecting systems in the agencies, we must take care that the Government information systems not overwhelm the non-Government activities, particularly those of the professional societies which are especially sensitive to the needs of the users.

It is still a mystery why the framers of the National Defense Education Act of 1958, Title IX, and Executive Order 10807 of 1959, which extended the National Science Foundation's responsibility "to provide for the coordination of national science information activities and provide or arrange for the provision of indexing, abstracting, translating and other services leading to a more effective dissemination of scientific information" could have expected OSIS to carry such a tremendous load. It would indicate that there was a lack of knowledge and understanding of the quantity of STI being generated by all of the agencies, by the private sector, as well as throughout the world, the extraordinary growth in Federal R&D programs all producing huge amounts of new technical information. The notion of Wiesner that a decentralized but coordinated system offered the most hope became the consensus position in the early 1960s.

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The Federal Council for Science and Technology was a hybrid organization. It had no intrinsic power of its own, yet exercised a considerable amount of power in Federal scientific and technological affairs. Obtaining consensus was its modus operandi. The members of FCST were usually the highest level person responsible for R&D within an agency. It was the responsibility of the agency FCST member to implement any of the agreements made by FCST. There were no penalties or sanctions for failure to carry out an agreement.

As a staff element in the Executive Office of the President, the Office of Science and Technology had no authority of its own to direct agency actions. It had to rely on presidential directives or OMB circulars, and, on some occasions, the willingness of one or more agencies to implement its policy declarations. The closest thing to power that OST had going for it was its proximity to power. Usually, OMB (early in the game it was the Bureau of the Budget, BOB) worked in close harmony with OST. OST played a role in the budget chain of events, a fact that was recognized by the agencies.

The President's Science Advisory Committee, which was, like FCST, chaired by the Science Advisor, held little intrinsic power on its own, but because of the high status of its members and the respect in which they were held in the world of science, did nevertheless demonstrate power, especially when they took a negative view on a matter. Their unwillingness to remain silent when they disagreed with a presidential policy was a thorn in the side of Presidents. When OST was terminated in 1973, at least one reason why President Richard Nixon did so was his inability (also the Science Advisor's) to prevent individual PSAC members from taking their disagreements to the press. As was said so often during the early 1960s, "Scientists were supposed to be on tap, not on top." In a sense, the collision came because of the different philosophies of science and politics - the former bent to seek the truth and the latter conditioned to balance expediencies.

Recognition of these realities is necessary to understand the successes and failures of OST and FCST and their committees and task forces.

As previously mentioned, COSATI came into being because of the interplay of forces in Congress and the Executive Office of the President, not because of the concerns of the scientists and engineers who led the Federal R&D programs. It is fair to say that the R&D managers who held sway in the late 1950s and early 1960s were no more enamored of creating agency STI programs than those who are in charge currently. Such enthusiasm that they were capable of encompassed the R&D process; the notion that Federal STI programs required expert management and that the STI manager deserved a place at his staff meetings was alien to the R&D manager during the early 1960s. This has not changed much today. With the formation of COSATI and the appointment of "high level" focal points to establish and operate agency STI programs, Federal R&D managers widened the circumference of their management concerns to include STI management. In most agencies it was not exactly a warm embrace, rather one of a head nod, a brushing of fingers in a hand shake, and hardly more. In a few agencies, such as DOD, NASA and AEC, the STI manager received a more courteous reception, and thus was able to get more support for his actions. This was reflected in the success of the agency STI program. There were, of course, other factors that contributed to the formation of COSATI.

The flowering of Federal science and technology, especially in the Department of Defense, Atomic Energy Commission, NASA resulted in a sharp growth in projects and funding. There was an outpouring of reports and other forms of information that overwhelmed the small library and information programs that were in evidence during the early Post-World War II period. Clearly recognized was the need to gather STI from all other sources - domestic and foreign - to be used as appropriate by the R&D managers and bench workers. Congress began to worry about the possibility of overlap and duplication in the many R&D programs of the agencies. Examples of this concern were provided during the hearings held by Senator Hubert H. Humphrey in

1962.¹ Here are a few of them:

It is apparent that the total efforts and funds expended for medical research in this country - and particularly those in the Federal government - should be coordinated so that the most beneficial results will be achieved. Medical research leaders have expressed concern over the fact that in many instances the absence of satisfactory bibliographic materials has resulted in wasteful duplication of efforts by medical researchers. Certainly, there is enough to be done in the important fields of medical research without the repetition of experiments successfully undertaken. A national library of medicine is essential to the efficiency and coordination of effort necessary in medical research.

--Senator John F. Kennedy, Congressional Record, vol. 102, Mar. 13, 1956, p. 4539.

Innumerable scientific discoveries are buried in our libraries, and many will be exhumed, but only after they are discovered anew, and discovered independently. Many of our scientific discoveries now might just as well not be made. ...Over and over again I have found forgotten work that could have advanced our science by many years -perhaps by many generations. Today, approximately 1 million scientific papers are published each year. When placed end to end they will reach to utter confusion.

--Conway Zirkle, professor of botany, Univ. of Pennsylvania, Symposium on Biological Communication, sponsored by Biological Abstracts, Philadelphia, October 1960, reprinted in Public Health Reports, vol 76, No.11, November 1961, p. 1035.

The annals of science include many cases of "lost" data, significant papers which did not come to the attention of investigators for years or decades after publication. The result of such cases in the past has been unnecessary duplication of effort, the waste of investigators' time and funds, and delays in the progress of research. The situation continues to be a source of considerable concern, perhaps more so today than ever before, as the volume of published information increases throughout the world.

--Author Unnamed, National Science Foundation, Basic Research - A National Resource, October 15, 1957, pp 52-53.

Wasteful duplication of efforts, scientific discoveries buried in libraries, forgotten work, and lost data - these were concerns that began to grow in and out of the government and helped till the ground for the formation of COSATI.

Another contributing factor was the arrival of new information technology. The photocopier made it possible for "every person to be his own publisher." The computer was the magical device to help us "control" the information explosion. The limitations imposed by inkprint and postal services began to disappear with the arrival of new information technologies and techniques for using them. Experimentation and testing of more sophisticated means of handling and delivering information increased dramatically among the Federal agencies. More thought was given to the sociology of

¹ U.S. Senate, Interagency Coordination of Information, Hearings before the Subcommittee on Reorganization and International Organizations, House Committee on Government Operations, U.S. Senate, Washington D.C, September 21, 1962, Part 1. 242 pages.

science communications. It was a period of expectations. There was a challenge to all participants in the information community to consider how to establish a national scientific and technical information system. This was one of the reasons why COSATI came into being - to create the first blueprint for an integrated Federal and non-government STI system and provide a locus that would bring all components involved in scientific and technical information programs into what was called "an harmonious array" of subsystems to serve science and technology.

Returning to the Role of the Federal Council for Science and Technology, Report for 1963 and 1964, the reasons for the establishment of COSATI are set forth (p.17). The reader is urged to read the following to determine if the arguments presented two decades ago are still meritorious.

How to record, store, and recall for use the flood of information generated by the total scientific and technological effort of this country - not to speak of the output of information from other countries - is one of the most complex and controversial problems facing modern science and technology. As the prime sources of funds for and the largest consumer of the results of this vast effort, the Federal Government has a direct interest in effective solution of the information problem. Scientific information which is not readily available does not exist for the scientist who needs it, and expenditures are wasteful and unproductive unless the scientific findings are accessible in usable form to the precise group that needs them. As a principal sponsor of R&D, the Federal Government has responsibilities for the combined effectiveness of the various governmental and private systems for dealing with the STI question.

The availability of advanced technology offers a partial approach to a solution of the problem, but much more is involved than the simple use of computers. What must be considered is the total process of recording, storing, retrieving, and distributing STI. The functions, operation, and technical design of libraries, the nature and function of abstracts, the function of journals, the expectations and real needs of individual scientists, and the organization and structure of scientific knowledge are all involved. It is clear that this vast problem will not be solved quickly, and that it will not be solved by any technological gimmick or any single plan. FCST set up a committee on Scientific and Technical Information to deal with these questions.

The Federal government still remains the principal sponsor of science and technology. This continues as a constant, but its record in dealing with the science communications part of its responsibility has fallen on hard times.